

1. Working together, Bill and Tom painted a fence in 8 hours. Last year, Tom painted the fence by himself. The year before, Bill painted it by himself, but took 12 hours less than Tom took. How long did Bill and Tom take, when each was painting alone?

Let T = # of hours Tom painted alone

$T-12$ = # of " Bill " "

$$T = 24$$

It takes Tom 24 hrs
and Bill 12 hrs to paint
the fence alone

$$T(T-12) \left[\frac{1}{T}(8) + \frac{1}{T-12}(8) \right] = 1(T)(T-12)$$

$$8T - 96 + 8T = T^2 - 12T$$

$$0 = T^2 - 28T + 96$$

$$0 = (T-4)(T-24)$$

2. Painters A and B can paint a wall in 10 hours when working at the same time. Painter B works twice as fast as A. How long would it take to each of them to paint it if they worked alone?

Let A = # of hrs for painter
A working alone

$\frac{A}{2}$ = # of hrs for B alone.

* Let B = # of hrs for B alone
or $2B$ = hrs for A alone

$$2B \left[\frac{1}{B}(10) + \frac{1}{2B}(10) \right] = 1(2B)$$

$$20 + 10 = 2B$$

$$B = 15 \text{ hrs}$$

$$A = 30 \text{ hrs.}$$

3. It takes Trevon ten hours to clean an attic. Cody can clean the same attic in seven hours. Find how long it would take them if they worked together.

Let t = time they work together

$$70 \left[\frac{1}{10}t + \frac{1}{7}t \right] = 1(70)$$

$$7t + 10t = 70$$

$$17t = 70$$

$$t = \frac{70}{17}$$

≈ 4.12 or 4 hrs, 7 min working together

4. A rectangular picture has a width that is two-thirds its length. The picture has an area of 294 sq. in. What are the dimensions of the picture?

$$\boxed{A = 294} \quad \frac{2}{3}l$$

$$\frac{3}{2} \left[l \cdot \frac{2}{3}l \right] = \left[294 \right] \frac{3}{2}$$

$$21 \text{ in} \times 14 \text{ in}$$

$$l^2 = 441$$

$$l = 21$$